

**From:** Robert Van Buskirk [rdvanbuskirk@gmail.com](mailto:rdvanbuskirk@gmail.com)  
**Subject:** Re: Newsletter: Energy and Economic Growth, March 2018  
**Date:** March 22, 2018 at 11:40 AM  
**To:** Peter V. Schwartz [pschwartz@calpoly.edu](mailto:pschwartz@calpoly.edu)

RV

Thanks Peter:

I am pretty sure that they will not keep the systems for 30 years. But maybe for 3-5.

Often I find myself sort of stuck on the casual approach to numbers.

Non-casual calculations take time and money that I often don't have.

What I have found in Malawi, is that if I take my casual calculations, turn them into a product and then distribute that product to people who benefit from its performance and low price, people can verify the calculation by experiencing the results. I validate my calculations by their reactions and direct benefit which I measure in studies like the household survey study I recently did. For me this is a non-traditional semi-scientific validation of my semi-scientific hypotheses and calculations.

The conundrum that I have with the SE4All group is that the results of my casual calculations indicates that one thing that makes their solutions too expensive for Africans is them...their desire to be involved and have programs discussing the issues when the salaries that they require are 100 times more than Africans and 10 times more than Chinese. My semi-scientific theories are not consistent with their personal financial self-interest, so they will be resistant to them and try to place a higher burden of proof on me to try to convince them, which will cost me more time and money.

You will notice for example that you when you look at the speakers list:

<http://www.seforallforum.org/speakers>

There are in fact no Chinese or other East Asians. Even though China produces the vast majority of solar equipment for Africa.

If the Chinese were there, they might say the logical thing of: "Look you are spending billions in subsidizing energy in Africa, if you spent that billions on subsidizing inexpensive Chinese products, you could provide energy access a lot quicker." And the Chinese would be more or less right. But that is not the type of thing that the group wants to hear, so the Chinese are not invited, because it is not good politics.

BTW, I cannot get a speaking slot at the SE4All event—I asked months ago, no reply. The main reason for me to go would be to network. Many of the folks who are there know me. Between now and then I would have to figure out some simple, non-confrontational messages to emphasize.

I probably cannot emphasize the 100X drop in the cost of solar electricity services cost because it relies too much at the moment on somewhat casual calculations.

We could perhaps do a less casual calculation on the cost of ISEC cooking vs. charcoal cooking, and present an argument or flyer that says solar electric cooking is soon to be cheaper than biofuel cooking and this is something that the SE4All folks should start thinking about. It might be good for you to own that calculation since it aligns well with your agenda.

My interest in ISEC is as a virtual battery, and my benefit/cost calculation in that regard is quite a bit more complicated, and not yet fully fleshed out: too undeveloped to present to folks at the SE4All conference.

So my main disagreement with your recommendations, is that I consider my audience to be the villagers in rural Africa. The audience of people from richer countries to me is a means to an end, of serving the audience in rural Africa. The problem with the audience in richer countries for me, is that they project their interests onto the technology and program and are not truly accountable to the beneficiaries in Africa. This means that aid turns into a competition over stories and narratives and gets divorced from the task of actually helping people in a cost-efficient way. That is how \$200M gets spent on energy access in Malawi, without providing hardly any electricity access to poor people. SE4All is one of these narrative and story-generating enterprises in my view. There are some good people working in the enterprise who would like to increase impact. I am interested in allying with such good people. But most folks are interested in their agenda which is allied with where the money is, and when you align the enterprise interest with money interests, the poorer people in the poorer countries wind up being left behind.

That is just the Berkeley in me.

Sincerely,

Robert VB

On 3/22/2018 10:40 AM, Peter V. Schwartz wrote:

Robert,

I think you're saying that there is a ~30% discount/interest rate in Malawi. However, I think your calculation overestimates the cost because it neglects the fact that they keep the solar systems for ~30 years after the one year payment period. But I may be missing something.

Something I offer as my uninformed observation... and have a lot of respect for everything you have taught me and the perspective you bring, and I may be very wrong... but I offer: Your intellect, education, and experience at LBNL puts you out of league with most people... I think. Your casual manner with the numbers can occur to those outside your field as magic. I encourage you to speak to a more general audience. I might be wrong about who you will find at this conference, but I would bet that few of them will grasp what you want them to grasp. And I think it's these untechnical people that we need to reach (as well).

You know better than I who will be at these conferences. However, if you are open to it, I would be pleased to help you adapt your presentation to mere mortals.

Looking forward to more discussion.

Pete

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On Mar 22, 2018, at 9:20 AM, Robert Van Buskirk <[rdvanbuskirk@gmail.com](mailto:rdvanbuskirk@gmail.com)> wrote:

Yes. So the cost per kWh I calculated should probably be multiplied by a payment time over the amortization time. Payment time is one year. amortization times in Africa are really short...2-3 years at most. So the actual levelized cost of electricity service is probably closer to \$10/kWh because the pay-off time is a year.

—RVB

On 3/22/2018 5:15 AM, Peter V. Schwartz wrote:

Robert,

This totally makes sense. Outrageous expensive. In the Kenyan system, the the users own the systems after a time?

Pete

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On Mar 22, 2018, at 1:38 AM, Robert Van Buskirk <[rdvanbuskirk@gmail.com](mailto:rdvanbuskirk@gmail.com)> wrote:

Dear Peter:

If you go to M-Kopa's page for example:

<http://www.m-kopa.com/products/>

they charge 50 Kenyan shillings per day for a system that has an 8W panel. At best, the systems is providing 20Wh/day, or 0.02 kWh/day. There are 100 Kenyan shillings to the dollar, so they are effectively charging  $(\$0.50/\text{day})/(0.02\text{kWh}/\text{day}) = \$25/\text{kWh}$ .

Some people charge more or less than Mobisol, but most African users of solar home systems and lights are paying the equivalent of the order of \$10/kWh for their systems because they are expensive on a per-Watt of capacity basis and because they are amortized over a short period of time.

I am playing a little fast and loose with the calculations.

You are familiar with concepts like the levelized cost of electricity:

[https://www.eia.gov/outlooks/aeo/pdf/electricity\\_generation.pdf](https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf)

I presume.

Capacity utilization shows up as a key factor in these calculations, and for our solar systems it is important to: how much do we actually use the capacity of the panel, the battery, and the end-use appliances. Those utilization factors combined with the unit cost of capacity and amortization over time will in some sense provide a "levelized cost of electricity service" where you include the capacity cost and utilization of the end-use load.

Does this make sense?

-Robert VB

On 3/21/2018 10:35 PM, Peter V. Schwartz wrote:  
Robert,

I think you should go if you can / want to, and present a talk and poster to make your pitch and include some of the things we're working on to make this happen... and to present a talk about ISEC as well? I mean if you go, then get all the exposure you can, now?

I apologize, but I don't understand your units of \$10/kWh. Do can't mean a kWh or battery storage, because that must be much more expensive than \$10. Do you mean \$10/kWh/day of electricity generating capacity? And what do you Mena by "end-use service"?

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On Mar 21, 2018, at 8:38 PM, Robert Van Buskirk <[rdvanbuskirk@gmail.com](mailto:rdvanbuskirk@gmail.com)> wrote:

Dear Peter:

Did a little more research. I can probably attend (if I commit the resources) by flying up from Malawi. I could probably keep the total cost down to about \$1000. And it would probably be useful to start nudging the community to start thinking about fast solar electricity cost innovation in preparation for next year when we might be ready to start really pitching a solution.

If I went, my religious preaching would probably contain the following basic tenets:  
(1) We need to go from \$10/kWh to preferably \$0.10/kWh (of end-use service) by 2030.  
(i.e. a ~30%/year drop in cost/price).

- (2) Cost improvements can be achieved by:
- (a) Using inexpensive commodity components
  - (b) Maximizing product distribution efficiency
  - (c) Maximizing system and appliance efficiency, including utilization efficiency
  - (d) Minimizing battery capacity requirements per unit panel output
  - (e) Providing efficient subsidies that allow the lowest income users to buy larger, more cost-efficient systems.
  - (f) Designing for Africa value-added content in assembly and distribution.
  - (g) Keeping end-use equipment costs below \$1/Watt of electricity input and keeping end-use equipment utilization efficiency high.

Sincerely,  
Robert VB

On 3/21/2018 1:16 PM, Robert van Buskirk wrote:

Thanks Peter:

I SHOULD have fit the SE4All conference into my schedule and budget:

<https://www.eventbrite.com/e/the-sustainable-energy-for-all-forum-2018-tickets-42002192689>

But I didn't. I now need to be in Malawi at that time. C'est la vie.

Just to tell you a story, back in the day (around 2011), I participated in hundreds of hours of government meetings to get their goal

"doubling the global rate on energy efficiency improvements by 2030"

formulated and codified... that is my claim to fame from my old efficiency policy days.

Since that time seven years ago, I have moved on, and I now formulate my clean energy in Africa goals quite differently. But I am not so inclined at the moment to sit in hundreds of hours of meetings these days to try to convince folks to restructure their goals to something that I might support like: "drop the unit cost of solar electricity for low-income rural Africans by 100X in 10-20 years." Which is what I would advocate now. A year from now, when we have a clear demonstration of the cooking-pot virtual battery, I think it will be a lot easier to advocate for such a goal and promote our product as a means of getting there. Right now, I don't think I personally am quite ready yet to confront the skepticism and inertia.

I agree that writing papers will help.

Nice haul of materials from Butler Sun Solutions. It looks like good stuff, though nothing that I need in particular at the moment. I have materials for doing what I need to do.

Sincerely,

Robert VB

On 3/21/2018 12:04 PM, Peter V. Schwartz wrote:

Robert,

Maybe you already receive this communication? Additionally it refers to a meeting May 2-3 in Lisbon. Do you go to these? I'd be really interested to attend... but maybe we have a little more to do. I think when we get this diode heater/phone charger down this summer, we should publish and attend some conferences. What do you think?

Also, we just got a whole bunch of stuff from Butler Sun Solutions going out of business. The list is [here](#). Let me know if you're interested in any of this by tomorrow... when I open it up to the rest of campus.

Pete

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Begin forwarded message:

**From:** EEG Programme Directorate <[eeeg@opml.co.uk](mailto:eeeg@opml.co.uk)>  
**Subject:** Newsletter: Energy and Economic Growth, March 2018  
**Date:** March 21, 2018 at 3:09:05 AM PDT  
**To:** PETER V. SCHWARTZ <[pschwartz@calpoly.edu](mailto:pschwartz@calpoly.edu)>  
**Reply-To:** EEG Programme Directorate <[eeeg@opml.co.uk](mailto:eeeg@opml.co.uk)>

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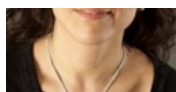
## Interview

**Marcela Tarazona**  
EEG Programme Director



**What is your role on EEG?**

My role is to set both the strategic direction of the programme and then to be responsible for its delivery.



I am accountable for translating the needs of the programme funder (DFID) into the design of the programme, ensuring these also match the needs of policy makers and civil society at a country and global level. We have designed this programme with policy maker and civil society demands at its heart - with impact as the overarching goal. All research will have academic rigour but we are aiming for it to be timely and responsive; providing solutions for policy makers and ultimately affecting behaviour change - as well as changing conceptual thinking on this topic.

I oversee the core team at OPM who bring their expertise to the programme. We have energy expertise, programme management and project management. Then we have an extended global network of people who focus on the research production and dissemination. This includes thought leaders with insight into the core needs of policy makers, which gives us all a reality check to keep the programme focused on real world demands.

#### **How has your previous career led you to this role?**

I feel that both my academic and professional life has led me to this programme; bringing together academia, applied research and a focus on policy makers who are making decisions about energy and economic growth in low income countries.

My PhD was in economics and I worked with economists, then I joined researchers working in applied research and undertook research in field settings for several years. Following this I transferred out of full time academia to roles at the Inter-American Development Bank and then the World Bank, I really enjoyed advising policy makers and understanding their perspective. Looking back it is clear now that these different experiences have led me to EEG - running a programme that is academically driven but is designed to meet real world needs.

#### **What have been EEG's biggest achievements so far?**

I am proud that the programme has already involved some of the world's best academics; identifying the gaps that need to be addressed in this field of research. We did this alongside a parallel process to identify the needs of countries and regions, and now have a programme which responds to those priorities.

#### **What excites you about the programme?**

We've brought together the world's best thinkers on the subject of energy and economic growth to solve real life problems. Access to energy sources is fundamental to so many lives, and sustainable economic growth is fundamental to the health of countries across the world. The long-term potential of EEG to make tangible differences to developing economies and people's lives is really exciting.

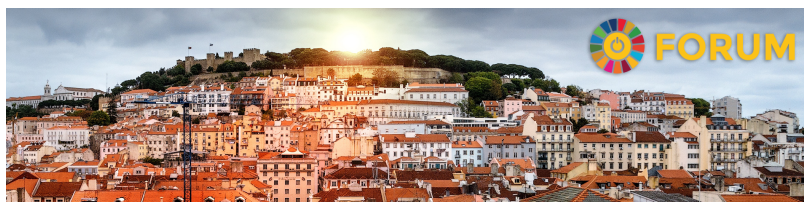
#### **What are its greatest challenges?**

Academic research doesn't always respond to the needs of policy makers and donors, it can take a long time and take a long view. Policy makers are dealing with urgent needs. We have addressed this with a programme which has identified policy makers requirements first and used them to determine the focus of our research. This motivation and incentive is different to a more traditional academic focus.

#### **What is your immediate focus?**

We are applying our research programme to three selected countries and working on the design of these research programmes now - as well as designing the global research programme. We have a call for proposals for research coming very soon which will be an important step for us.

## **Events**



### **EEG to host a roundtable discussion on energy systems planning for low-income countries at the UN SE4All Forum, May 2-3 in Portugal**

The 2018 [Sustainable Energy For All Forum](#) held on 2-3 May in Lisbon will bring together more than 750 leaders from government, business, civil society and international organisations to discuss key challenges in achieving the Sustainable Development Goal (SDG) 7 — ensuring equitable electricity access, accelerating renewable energy uptake and improving energy efficiency.

At the landmark gathering, EEG will convene a roundtable discussion on strategic energy

At the roundtable gathering, EEG will convene a roundtable discussion on strategic energy planning in low-income countries. Strategic energy planning has been identified as an essential part of policy and decision-making in the energy sector, and is crucial to enabling the scale-up in investment needed to meet economic and social development goals.

This roundtable follows a previous discussion hosted by the UK Department for International Development in November 2017, prior to the Knowledge Exchange Forum of the World Bank's Energy Sector Management Assistant Programme (ESMAP). Held at the Department for Business, Energy & Industrial Strategy in London, this initial roundtable discussion explored tactics to improve the way in which development partners support strategic energy planning in developing countries.

In attendance, were representatives of major donors, international organisations and technical organisations operating in the energy sector, along with EEG's Marcela Tarazona and Ryan Hogarth as observers.

A key outcome from the discussion was that donors agreed to work together to investigate improvements to the way that decision-support tools, models and data used in energy systems planning are created, accessed and maintained in developing nations.

Energy system models and decision-support tools are designed to provide data and evidence to inform governments' strategic energy plans, public and private investment choices and operational decisions. Development partner-funded models and decision-support tools, however, are frequently ineffective at improving decisions-making.

Beyond hosting the follow-on event at the SE4All Forum, EEG is also conducting a joint scoping exercise with the UK Energy Systems Catapult, which will identify and assess the following:

- The current modelling capacity of developing country actors and the planning and modelling support they require
- Existing donor support initiatives for energy planning in low- and lower-middle income countries
- The energy modelling and decision support tools available for developing country governments

By supporting this DFID-led initiative, EEG aims to advance its ultimate objective – fostering evidence-based energy programming in low-income countries.

To see the results of the roundtable follow the discussion via Twitter [@OPMglobal](#) or look out for our report in the next newsletter.

## Work in focus



### EEG to launch its first country research programme in Sierra Leone

One of the primary mechanisms through which EEG will support research on energy systems in low-income countries is country programmes. Country programmes are geographically concentrated (rather than topically), and research topics, research uptake and capacity development activities are driven by the demands of local energy stakeholders, particularly the national governments, utilities and DFID country offices.

EEG is now ready to launch its first country programme in Sierra Leone. We have arrived at this point after a scoping exercise conducted by OPM's Simon Trace and Richard Williams, who travelled to Freetown to interview numerous policy makers and energy stakeholders. Through a systematic process to identify demand for EEG research, they narrowed down a series of potentially high impact research opportunities.

In the coming weeks, EEG will release calls for proposals outlining the key research questions identified by Sierra Leone's energy stakeholders, and invite application for funding. Watch this space.

## Programme updates

### EEG Part 1 – The building blocks of a demand-led research programme

EEG has recently begun its second of two phases. Part 1 of EEG focused on engaging with policymakers to create a demand-led research agenda for Part 2.

Research priorities for EEG Part 2 were defined through a systematic and highly inclusive process, which served to identify two factors:

- Current state-of-knowledge: In Part 1, EEG produced 18 state-of-knowledge papers, written by leading researchers spanning economics, political science and engineering. The papers identified key research questions and knowledge gaps on a variety of topics related to energy systems in low-income countries. All 18 of the state-of-knowledge papers can be found on our new [website](#).
- Demand for research from energy stakeholders. In Part 1, EEG held regional workshops in Tanzania and Nepal and a Research and Matchmaking (R&M) Conference in Washington, DC. We also co-hosted a workshop with the UK Energy Research Partnership (ERP) in London to garner input from UK industry stakeholders. These events fostered a collaborative discussion between policy makers and energy stakeholders regarding the most pressing knowledge gaps and policy questions. Reports on the main outcomes of each of these meetings can be found on the [website](#).

Our understanding of the current state-of-knowledge regarding energy systems in low-income countries will help us ensure that future research commissioned by EEG is novel and ground-breaking. Our strong understanding of the research demanded by energy stakeholders in low-income countries, including policymakers, donors and industry practitioners, will help us ensure that future EEG research is demand-led and applied.

## News

### Website Launch

Our website is now live at [energyeconomicgrowth.org](http://energyeconomicgrowth.org), providing an interactive knowledge hub for those interested in the connection between large scale energy projects and economic growth in developing countries.

Visitors can find out more about our core projects, driven by widely applicable research aims, and current in-country programmes such as Myanmar and Sierra Leone, as well as our four priority research areas: efficiency and productive use, reliability, renewable energy and grid access.

Our publications hub provides ongoing access to thematic papers, technical reports and project updates.

At the end of March, calls for applications will be published on the website.



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